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SHOWER HEAD WITH NOZZLES HAVING SELF CLEANING TIPS

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention relates to a shower head, and, more particularly, to a shower head having a plurality of nozzles with self cleaning tips.

2. Description of the Related Art.

Conventional shower head designs include those having a shower head housing with passageways allowing water sprays to flow from the shower head as well as designs having a shower head housing with passageways accommodating external nozzles mounted thereon through which water sprays are formed. Furthermore, shower heads having a surface with a plurality of passageways, or nozzle orifices which utilize a backing disk having a plurality of resilient and flexible nozzle tips protruding through the nozzle orifices are known. The resilient nozzles of these known shower heads allow for convenient elimination of the build-up of calcium or other deposits by manually flexing the resilient nozzles when it appears that material is collecting therein. In these known shower heads, the entire nozzle is formed of a resilient and flexible rubber which does not match the finish of, e.g., a brass or chrome shower head.

SUMMARY OF THE INVENTION

What is needed in the art is an aesthetically pleasing nozzle for affixation to a shower head having, e.g., a chrome or brass finish, which nozzle has an identical finish to the external shower head housing and which includes a self cleaning tip for conveniently eliminating the build up of, e.g., calcium or other deposits.

The present invention provides a shower head having a plurality of nozzles, with the exterior finish of both the shower head housing and the nozzles being consistent. For example, both the shower head and the nozzles may have either a chrome or a brass exterior finish. The nozzles of the shower head of the present invention each have a nozzle insert positioned therein, with the nozzle insert having a flexible nozzle tip protruding from the nozzle. Each nozzle insert includes an passageway in fluid communication with the water inlet of the shower head, whereby water introduced into the shower head is ejected from the shower head through the passageway in the nozzle insert. The flexibility of the nozzle tip provides a convenient mechanism for eliminating the build up of, e.g., calcium or other deposits by manually flexing the nozzle tip.

The shower head of the present invention advantageously provides nozzles having an exterior finish consistent with the exterior finish of the shower head to which they are attached and which include flexible self cleaning tips.

An advantage of the present invention is the ability to provide a nozzle having a consistent finish with respect to the shower head to which it is attached and which includes a self cleaning tip. The self cleaning tip of the shower head is formed in a rubber insert positioned in the nozzle of the present invention, which rubber insert has a more precise water outlet passageway relative to a water outlet passageway formed directly in a metallic nozzle. The rubber outlet can be formed with a variety of surface finishes, and in a variety of colors to provide an aesthetically pleasing contrast to the matching finish of the nozzle and shower head.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features and advantages of this invention, and the manner of attaining them, will become more apparent and the invention itself will be better

understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of a shower fixture including a shower head in accordance with the present invention;

Figure 2 is an exploded view of a nozzle plate with a plurality of nozzles mounted thereon;

Figure 3 is an exploded view of a nozzle and nozzle insert in accordance with the present invention;

Figure 4 is a plan view of a nozzle in accordance with the present invention;

Figure 5 is a sectional view of the nozzle of Figure 5;

Figure 6 is an exploded sectional view of a nozzle and nozzle insert in accordance with the present invention;

Figure 7 is a plan view of an alternative embodiment nozzle in accordance with the present invention;

Figure 8 is a sectional view of the nozzle of Figure 7; and

Figure 9 is an exploded sectional view of Figure 7.

Corresponding reference characters indicate corresponding parts throughout the several views. The exemplifications set out herein illustrate exemplary embodiments of the invention, and such exemplifications are not to be construed as limiting the scope of the invention in any manner.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings and particularly to Figure 1, shower head 20 in accordance with the present invention is generally illustrated as connected to a shower fixture including water pipes 22 and temperature and flow control handles 24. As illustrated in

Figure 1, shower head 20 includes housing 56 operably connected to water pipes 22 via water inlet 58. Shower head housing 56 further includes nozzle plate 26 connected thereto. Nozzle plate 26 accommodates a plurality of nozzles 28 affixed thereto.

Figure 2 illustrates nozzle plate 26 in further detail. As illustrated in Figure 2, nozzle plate 26 includes a plurality of threaded nozzle passageways 60 sized to receive threaded ends 36 of nozzles 28. O-ring 30 is positioned intermediate each nozzle 28 and nozzle plate 26. Referring to Figure 3, nozzle 28 includes concave O-ring recess 34 sized to accommodate O-ring 30 positioned therein. In construction, O-ring 30 is placed about threaded end 36 of nozzle 28, and threaded end 36 is thereafter threaded into nozzle passageway 60 (Figure 2) of nozzle plate 26 to affix nozzle 28 to nozzle plate 26. To assemble shower head 20, a tool, e.g., a socket wrench, can be positioned about hexagonal portion 38 of nozzle 28 to tighten nozzle 28 to nozzle plate 26. When nozzle 28 is tightened to nozzle plate 26, O-ring 30 is compressed and forms a tight seal preventing water leakage about the periphery of nozzle 28 abutting nozzle plate 26.

As illustrated in Figures 3-6, each nozzle 26 includes nozzle insert passageway 42 terminating in nozzle tip passageway 52. Nozzle insert passageways 42, 52 accommodate nozzle insert 40 as illustrated, e.g., in Figure 5. In construction, nozzle 28 and nozzle insert 40 are formed, and nozzle insert 40 is thereafter positioned in nozzle insert passageways 42, 52 as illustrated in Figures 4 and 5. When nozzle insert 40 is positioned in nozzle 28, shoulder 64 formed by the end of outer sleeve 46 opposite water inlet 50 abuts shoulder 66 of nozzle 28. Shoulder 66 of nozzle 28 is positioned intermediate nozzle insert passageway 42 and nozzle tip passageway 52. In use, the water pressure developed in water inlet 44 of nozzle 28 forces shoulders 66, 68 into abutting relationship. When nozzle insert 40 is

positioned in nozzle 28, with shoulders 64, 66 placed in abutting relationship, nozzle tip 32 protrudes about 1-2 mm from nozzle 28.

Referring to Figure 6, nozzle insert 40 comprises a co-injected part having inner cannulated member 48 and outer sleeve 46. Inner cannulated member 48 includes nozzle tip 32 with water outlet 54 formed therein. Nozzle insert 40 further includes water inlet 50 which is in fluid communication with the water inlet to shower head 20 (i.e., water inlet 58) when nozzle 28 is operably positioned on nozzle plate 26. In use, water flows through water pipes 22 (Figure 1) to water inlet 58 of shower head 20, and thereafter reaches water inlet 44 of nozzle 28, and water inlet 50 of nozzle insert 40 before being ejected through water outlet 54 of nozzle insert 40. As illustrated, e.g., in Figure 5, the flow path through nozzle 28 and nozzle insert 40 is stepped from water inlet 44 to water outlet 54. The decreasing cross-sectional area from water inlet 44 to water outlet 54 advantageously increases the velocity of the water flowing through nozzle 28 and nozzle insert 40.

Both inner cannulated member 48 and outer sleeve 46 of nozzle insert 40 are formed of a polypropylene based material. Inner cannulated member 48 is formed of a flexible and resilient polypropylene based material having a shore hardness of about 30-50 Sh A (e.g., a polypropylene/EPDM compound). In one exemplary embodiment, inner cannulated member 48 is formed of SANTOPRENE (SANTOPRENE is a registered trademark of AES (Advanced Elastomer Systems)). In another exemplary embodiment, inner cannulated member 48 is formed from EPDM rubber. Outer sleeve 46 of nozzle insert 40 is formed of a harder polypropylene based material (relative to inner cannulated member 48) having a shore hardness of about 90 Sh A or higher. Nozzle tip 32 of nozzle insert 40 is sufficiently flexible and resilient to allow for manual flexing of nozzle tip 32 to conveniently remove calcium or other deposits. Outer sleeve 46 is generally formed of a material of sufficient hardness to

provide structural stability and/or rigidity to nozzle insert 40. Since both inner cannulated member 48 and outer sleeve 46 are formed from material based on polypropylene, the two parts have a good bond therebetween no matter that they are obtained by means of a co-injection process (that is with an injection molding press able to inject two different materials at the same time) or by means of an insert molding process where the outer sleeve 46 is used as an insert for the subsequent molding of the inner cannulated member 48.

Shower head 20 has several aesthetically pleasing characteristics, including a consistent exterior finish of both shower head 20 and nozzles 28. For example, both shower head 56 and nozzles may have either a chrome or a brass exterior finish. Furthermore, nozzle insert 40 may be formed with a variety of surface finishes, and in a variety of colors so that nozzle tip 32 provides an aesthetically pleasing contrast to the matching finish of nozzle 28 and shower head 20.

Figures 7-9 illustrate an alternative embodiment nozzle in accordance with the present invention. As illustrated in Figures 7-9, nozzle 28' has a different geometry relative to nozzle 28 illustrated, e.g., in Figures 4-6. Specifically, nozzle 28 includes hexagonal portion 38 having planar sides generally parallel to the longitudinal axis of nozzle 28, with conical portion 62 extending therefrom, while the body of nozzle 28' includes a curved outer surface with hexagonal portion 38' formed therein. Other than its exterior geometry, nozzle 28' is identical to nozzle 28 and, for the sake of brevity, is not now described in detail.

While this invention has been described as having a preferred design, the present invention can be further modified within the spirit and scope of this disclosure. The application is therefore intended to cover any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures

from the present disclosure as come within known or customary practice and the art to which this invention pertains and which fall within the limits of the appended claims.